



# Research Journal of **Forestry**

ISSN 1819-3439



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## Review Article

# Non Timber Forest Products (NTFPs) for Sustained Livelihood: Challenges and Strategies

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## Abstract

**Background:** Non-timber forest products (NTFPs) constitute an important source of livelihood for millions of people from forest fringe communities across the world. In India, NTFPs are associated with socio-economic and cultural life of forest dependent communities inhabiting in wide ecological and geo-climatic conditions throughout the country. It is estimated that 275 million poor rural people in India, depend on NTFPs for at least part of their subsistence and cash livelihoods. The NTFPs also serve as a vital livelihood safety net in times of hardship. Furthermore, the NTFP extraction has multiplier effects in the economy by generating employment and income in downstream processing and trading activities. However, depletion of NTFPs resources on account of indiscriminate exploitation, deforestation and forest degradation have a major issue of concern that may affect the NTFP based livelihood and economics. **Conclusion:** This study attempts to outline the extent, reliance and livelihood significance of NTFPs for forest dependent communities and to suggest strategies for their sustainable development and utilization. Challenges and strategies of NTFP management which will be useful in sustainable development of resources vis-a-vis provide livelihood opportunities to the poorest section of society have been discussed.

**Key words:** Non-timber forest products, livelihood, sustainable development, tribal

**Received:** December 15, 2015

**Accepted:** February 09, 2016

**Published:** June 15, 2016

**Citation:** A.K. Pandey, Y.C. Tripathi and Ashwani Kumar, 2016. Non timber forest products (NTFPs) for sustained livelihood: Challenges and strategies. Res. J. For., 10: 1-7.

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**Competing Interest:** The authors have declared that no competing interest exists.

**Data Availability:** All relevant data are within the paper and its supporting information files.

## **INTRODUCTION**

The NTFPs play important roles in the livelihoods of millions of rural and urban people across the globe<sup>1-3</sup>. It is well established that NTFPs fulfil multiple functions in supporting human well being. The NTFPs provide the products for food, shelter, medicines, fibres, energy and cultural artefacts for many of the world's poorest people and a considerable proportion of the less poor<sup>4-8</sup>. The contribution of these daily net resources to livelihoods typically ranges from 10-60% of total household income<sup>9,10</sup>. The NTFPs also provide many households with a means of income generation, either as supplementary income to other livelihood activities, or as the primary means of cash generation<sup>10-14</sup>.

Non-timber forest products (NTFPs) are goods of biological origin other than timber from natural, modified or managed forested landscapes. They include fruits and nuts, vegetables, medicinal plants, gum and resins, essences, bamboo, rattans and palms; fibres and flosses, grasses, leaves, seeds, mushrooms, honey and lac etc. The NTFPs can also be referred to as all the resources or products that may be extracted from forest ecosystem and are utilized within the household or are marketed or have social, cultural or religious significance<sup>15,16</sup>. Majority of rural households in developing countries and a large proportion of urban households depend on the products to meet some part of their nutritional, health, house construction, or other needs<sup>1</sup>. The NTFPs create high economic value and large-scale employment. The NTFPs have attracted global interest due to the increasing recognition of the fact that they can provide important community needs for improved rural livelihood<sup>17,18</sup>.

Globally, more than a billion people depend directly on forests for their livelihoods and the remaining six billion of us depend on forests for a variety of economic, social and environmental benefits such as the rainfall, biodiversity, pollinators, carbon storage and clean water they provide. Out of which NTFPs contribution is significant in providing adequate food, fuel, feed, health and fiber for growing populations. The importance of NTFPs in rural livelihoods in developing countries has become widely acknowledged. In India, NTFPs contribute an income equivalent to US\$ 2.7 billion per year and absorb 55% of the total employment in forestry sector. Moreover, 50% of forest revenues and 70% of forest based export income come from such resources<sup>19,20</sup>. They provide 50% of the household income for approximately one third of India's rural population. Considering the importance of NTFPs in the livelihoods and wellbeing of local people, especially in the developing world, it is intriguing why

the sector still receives so little attention in development policies and budgets as well as in programmes and budgets from relevant government departments, such as for forestry, agriculture, rural development, environment or energy<sup>21</sup>. In this paper we suggest challenges and strategies of NTFP management which will be useful in sustainable development of resources vis-a-vis provide livelihood opportunities to the poorest section of society.

**Categories and uses of NTFPs:** The NTFPs use is characterized by a diversity of institutional arrangements regarding access to the resources and markets at both local and national level. There is, however, great variation in the extent to which forest products are used from area to area and even between households within a community. Because of this variation, it is difficult to abstract generalizations about NTFPs use. The NTFPs can be classified into different categories, based on the purpose of use (for example, as food, fuel, medicine, household utensils and farm implements); the part of plants harvested (leaf, fruit, stem and roots) and level of use (self supporting and commercial). Once viewed as the products of poor unlike that of the timber for the rich, NTFPs provide a green social security to billions of people in the form of food supplements, traditional medicines, fuel and fodder, low-cost building materials and source of employment and income generation. In some cases, the revenues earned from NTFPs are the only source of cash income, which increases the dependency of people on commercially interesting NTFPs resources.

**NTFPs-vital source of nutrition and medicine:** In traditional forest communities, many NTFPs are a part of household subsistence strategies, providing macronutrients, carbohydrates, fats and proteins, or other essential micronutrients such as various minerals<sup>22</sup>. The NTFPs can be staples for those living near forests, or part of coping strategies when regular access to agricultural commodities is not possible. In a second important 'level' of food, NTFPs are used for feeding livestock. The NTFPs such as grasses and leaves are collected by rural communities to feed or house livestock, or to meet other needs such as providing ground cover for them to sleep on. Since in many cultures such livestock provides dietary and living staples (e.g., milk, meat, leather, fur, hair, horns and manure), collecting these non-edible NTFPs can be central to rural development.

For millennia, NTFPs including medicinal plants remained as an important source or raw material for traditional systems of medicines like Ayurveda, Chinese, Unani, Siddha, Tibetan

and others across the globe<sup>23</sup>. Many modern medicines are based on wild plants or their extracts. Yet, in many developing countries with limited access to modern medicines, the World Health Organisation (WHO) estimated that up to 80% of the population rely on traditional medicines, mostly plant-based drugs, for their primary health care. In many cases, such medicines are a prime source of health care available to the poor and many people use these remedies. In fact, the percentage of people using traditional medicines is 40-50% in Germany, 42% in the USA, 48% in Australia and 49% in France. Both in China and India, traditional medicines based on wild plant and animal source are major export industries.

**Livelihood significance of NTFPs:** In Indian context, NTFPs are associated with socio-economic and cultural life of forest dependent communities inhabiting in wide ecological and geo-climatic conditions in different concentrations throughout the country<sup>24,25</sup>. Tribal livelihood systems vary considerably between different regions as also among the various ethnic groups, depending on ecological, historical and cultural factors. These tribal communities largely occupy the forest regions since time immemorial, living in isolation from the mainstream life, maintaining harmony and a symbiotic relation with nature. The NTFPs also serve as a vital livelihood safety net in times of hardship. Collection of NTFPs by communities primarily for meeting their subsistence needs it varies from state to state ranging from 5.4-55% in the country. In Manipur alone, a North-Eastern state of India, nearly 90% of the population depends on forest products as a major source and some 250000 women are employed in collecting forest products. In Bastar district of Chhattisgarh, about 75% of forest dependent people supplement their food by tubers, flowers and fruits all the year round. As per Government of India report, at least 35 million man-days of employment were generated in the NTFPs trading which includes collection and rprocessing of economically valuable NTFPs species. Studies have revealed that NTFPs provide substantial inputs to the livelihoods of forest dependent population, many of whom have limited non agricultural income opportunities<sup>26</sup>. It is estimated that 275 million poor rural people in India i.e., 27% of the total population, depend on NTFPs for at least part of their subsistence and cash livelihoods. This dependency is particularly intense for half of India's 89 million tribal people, the most disadvantaged section of society, who live in forest fringe areas. About 70% of the NTFP collection in India takes place in the tribal belt of the country, whereas, 55% of employment in forestry sector is attributed to NTFP sector. While NTFP collection is a major source of income and employment for forest dwellers, it holds multi-fold impact on

economy through downstream processing and trading activities<sup>27</sup>. However, tenure security, lack of processing skills and narrow market access are the limiting factors restraining the generation of greater benefits from these resources.

Nevertheless, on account of upsurge in demand for natural products, NTFPs acquired huge commercial value in trade and industries<sup>28</sup>. Trade in NTFPs can act as an incentive for forest conservation by providing a source of income from resources that might otherwise appear to have little financial value. Moreover, in this era of the globalization, the marketing and pricing of the NTFPs are being determined as never before, by millions of unseen hands, from those of forest collectors to that of food and drug companies sitting in faraway places.

**Global attention on NTFPs:** The past decade has witnessed a rapid growth and upsurge in global interest in NTFPs of among conservation and development organisations due to the increasing recognition that NTFPs can contribute significantly to the livelihoods of forest dependent communities, household food security and nutrition; generate additional employment and income and offer opportunities for NTFP based enterprises<sup>29-31</sup>. Around one billion people rely on wild harvested products for nutrition and income and the invisible trade in wild resources is estimated to generate \$ 90 billion/annum. In India alone the livelihoods of around 6 million people are maintained by the harvest of forest products.

In developing countries, deforestation, forest degradation, biodiversity loss and rural poverty have long been important concerns in forest governance. The search for effective forest governance arrangements that meet the challenges of sustainable forest use remains an important issue. It has been proposed that long-term economic benefits from sustainable NTFP extraction might be significant enough to prevent forests from being put to more destructive land uses such as logging, mining or ranching and help lower rates of tropical deforestation. It is now believed that the promotion of sustainable use of NTFPs could lead to a win-win situation for poverty reduction and biodiversity conservation. Furthermore, NTFPs can be harvested with relatively little impact on the forest environment.

**Management interventions:** Importance of NTFPs has moved to the centre stage of the global development agenda<sup>21</sup>. In the past two decades, a number of countries have begun to fine-tune and well-intentioned forest policies to reflect the socio-economic, ecological and cultural realities of NTFP use. This has resulted in a number of specific improvements to

the ways in which these products are regulated, including re-thinking the use of costly and complex inventories and management plans for NTFPs. The Food and Agriculture Organisation (FAO) was one of the first agencies to promote NTFPs through their programme on NTFPs. Over the past 20 years, other international agencies such as the World Bank (WB) and Canadian International Development Agency (CIDA), International Development Research Centre (IDRC), Centre for International Forestry Research (CIFOR), International Union for the Conservation of Nature (IUCN) and the Biodiversity Support Programme (BSP), among others, have incorporated the concept of NTFPs into their research and development programmes. The concept of NTFPs, therefore, became an economically acceptable ecological option of development. Within the context of emerging new international commitments to address rural poverty, such as the Millennium Development Goals (MDGs), the commercialisation of NTFPs is recognised as having the potential to achieve dual conservation and development goals by increasing the value of forest resources to local communities for poverty reduction through livelihood generation.

Some of the following strategies need to be addressed for sustained livelihood through NTFPs.

**Sustainability:** The sustainability of NTFP harvest depends on the organs that are harvested but also on the life cycle of harvested species. Good collection/harvesting practices of some important medicinal plants like i.e., aonla (*Phyllanthus emblica*), baividang (*Embelia tsjeriam-cottam*), baheda (*Terminalia bellerica*), gudmar (*Gymnema sylvestre*), sarpagandha (*Rauvolfia serpentina*), kalmegh (*Andrographis paniculata*) and bark of arjuna (*Terminalia arjuna*) have been standardized<sup>32</sup>. Adoption of sustainable harvesting practices at right time of harvest showed positive impact on resource conservation, socio-economic status of community, quality of produce and economic returns. It is evident from our study that the medicinal plants collected at right time of maturity following sustainable harvesting practices possess better quality in terms of active ingredients concentration. Harvesting practices/standards are available only for few commercially important species. The sustainable techniques/standards for other important species need to be

developed<sup>21</sup>. Most NTFPs can be harvested in more than one way. Option should be chosen considering the lowest impact on the individual plant or the population remaining.

**Monitoring system:** Most of the collectors are not aware about the rules and regulations pertaining to harvest and management of NTFPs. The monitoring and enforcement of laws also varied considerably across central India. There is also the greatest lack of clarity as to who is responsible for monitoring and enforcing rules about harvesting and marketing of NTFPs. There is urgent need for development of effective and locally appropriate participatory monitoring mechanism. Adoptive monitoring mechanism with the active involvement of people needs to be developed. Sometimes third party monitoring can also be done. The developed harvesting practices may be modified in light of monitoring results.

**Post-harvest technologies:** Post harvesting practices e.g., drying, processing, storage and packaging can make a major difference to price and quality of produce.

**Adding value:** The majority of NTFPs sold by collectors/harvesters did not undergo only basic value-addition. The activity of value addition is largely performed by market intermediaries and manufacturers and there is little value addition at the primary collector's level. Interventions like preparing time schedule for collection of material, identification of correct plant and their parts, maintaining hygienic conditions while collection, following non destructive harvesting techniques, removal of foreign material from the collected product, sorting, drying and storage appropriately and packaging of collected material. Therefore, some value addition such as drying, chopping or cleaning at collector level will increase the value and quality of the produce.

**Harvest of produce at right stage of maturity:** Harvesting time contributes significantly to the quality of produce. Kalmegh harvested at right time fetch better returns as it contains better amount of active ingredient (andrographolide)<sup>33</sup>. Harvesting time plays important role

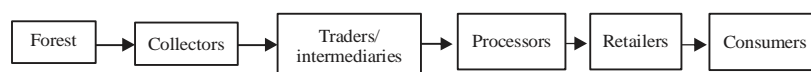


Fig. 1: NTFPs marketing channel

in quality of sarpagandha roots. Highest root yield and alkaloid content was obtained in the crop harvested after 18 months of planting in the month of december<sup>34</sup>. Maximum embelin (4.64%) content was obtained in the fruits of *Embelia tsjeriam-cottam* (baividang) harvested after maturity i.e., in the month of december<sup>35</sup>.

**Diversifying:** As many NTFPs are seasonal, the opportunities for diversifying need to be explored. Studies conducted in India and elsewhere indicated that the collectors derive income from more than one NTFP. They also engage in other economic activities to provide a diversification of household revenues. For most harvester households, an average of 42% of their annual income comes from NTFPs.

**Marketing system:** The NTFPs value chains are complex, with multiple stages and actors involved in the process of getting a product from forest to consumer; they are also dynamic and change over time. Therefore, information about the quantity and quality of the product, price and their market is very important.

The market of NTFP is extremely imperfect and unstructured. At present forest dwellers collect NTFPs and sell it to local traders which in turn sell it to the urban centre and finally reach to consumers. The distribution channel from forest collector to urban wholesaler consists of 3-5 middlemen. These men are known as kutchias (middlemen), the agents of the traders. The kutchias speak the language of the tribals and in many cases shell out loans as advance payment for NTFP. They hustle the tribal, cheating them on weights and rates as tribals mostly count in traditional scales and are unfamiliar with the metric measure. The tribals have to sell their material as they need the money to buy weekly supplies. Yet most forest people have poor access to markets, insufficient capital to invest in improving their livelihoods and little or no bargaining power when selling their products in markets. Due to lack of direct access to markets, they depend on intermediaries to sell their products, reducing their share of the income. There were at least four levels of intermediaries between the collectors/gatherers and processing centre. A typical marketing channel of NTFPs is represented in Fig. 1.

Different types of information, such as price, value addition options and sustainable harvesting techniques are required by communities to increase their bargaining power and receive higher prices for their products. A social-networking forum must also be developed for exchanging market information within different stakeholders. To sell NTFPs at fair prices, forest dependent communities need access to an open and efficient market. Collective

marketing approach as an NTFP based intervention can support communities with knowledge, confidence and processes to operate as a non-exploitative channel for the marketing of products. Creating such a market would generate higher revenues and offer a strong incentive for forest dependent communities to take on increasing responsibility for forest management and promote more efficient forest utilization.

**Challenges and emerging issues:** On account of their potential role in livelihood and poverty alleviation, NTFPs have gained new attention in international debates that make it urgent for governments to put in place pro-poor reforms in the forest sector to protect and enhance the livelihood benefits that forests provide to the poor. If this is to be realized, local communities will get more secure rights if they are to be involved in managing and protecting large areas of forests globally. However, in many countries, regulatory frameworks are not clearly defined or do not provide adequate security of tenure for forest dependent communities. Investment in locally controlled forestry requires certain preconditions. With greater information, effective consultations with stakeholders and strategic approaches to policy-making, NTFP laws and policies can promote ecological sustainability, equity in trade and improved rural livelihoods. The extent of commercialization and the heterogeneity of NTFP resources, markets and stakeholders should be reflected in policies and laws. The NTFP policies work best when incentives and supportive legal frameworks are promoted, including government support for producer, trade and processing groups, market access and premium prices through certification, tax breaks and outreach and education on new policies and laws. In some cases, particularly when there is sudden and high commercial demand, a more involved regulatory framework is also necessary, including permits, quotas, taxes and restrictions on trade. Governments will need to approach NTFP regulation in ways that reflect the financial, ecological and social costs and benefits of such actions, government implementation capacity and the likelihood of compliance.

## CONCLUSION

It is apparent that the contribution of NTFPs to income varies across ecological settings, seasons, income level, etc. They contribute to improving nutrition either as part of the family diet or as a means to achieve household food security. It has been established that a significant number of rural, tribal and overall forest dependent communities derive a significant

part of their food, nutrition, healthcare needs and income from NTFPs. They also contribute to the well-being of rural households, particularly the poor, in terms of food security, nutrition, health and subsistence. However, a number of factors, including a policy vacuum, non-destructive harvesting, destruction of natural habitats, bushfires, population growth and high demand, are hindering the use and development of NTFPs. An appropriate policy framework for a sustainable promotion of NTFPs, domestication of NTFPs, improving harvesting and processing techniques are necessary to facilitate food security, reduction of poverty and improved livelihoods, particularly for the economically-marginalized and forest-dependent communities.

Augmenting livelihoods of the forest dependent communities requires some focused intervention on NTFPs. Facilities pertaining to storage, grading, processing and value addition through convergence of existing schemes and programs in private and public sectors should be promoted and created. Communities should be empowered with information about the market, policy and products to enable them strategizing and accessing better returns from NTFPs.

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